Mineral potential modelling of onshore Zealandia

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Mineral potential models for the onshore region of Zealandia have been created for orogenic Au-W-Sb, epithermal Au-Ag and intrusion-related Au (±W-Bi-Mo-Sn) mineralisation using a mineral systems approach. The project was motivated by the release of new publicly available geological, geophysical and geochemical data added to existing digital data sets and the knowledge of well-studied mineral deposits in New Zealand. The mineral systems approach is a method used to define ore deposits from generation, through formation and to post-mineral processes in a geodynamic setting at varying geospatial scales and different time periods. Using this framework, predictive maps are created representing source rock, fluid source, enrichment and focusing mechanism, trap site, and the surface expression components of the mineral system for each mineralisation type. GIS-based modelling is used to identify where the critical components of the mineral system co-exist and to what extent, therefore ranking the prospectivity and potential of a mineral deposit occurring. We have used the fuzzy logic modelling technique, an easily understood knowledge-driven approach, to combine the predictive maps first into maps of the critical components, and then finally into the mineral potential models. The three maps produced for this study use the same approach as the lithium, mafic Ni-Cu (±Co-Cr-PGE), rare earth element, and aggregate mineral potential models recently completed by GNS Science. The results of this modelling show the mineral potential for orogenic, epithermal and intrusion-related mineralisation for onshore Zealandia to support exploration investment and provide information for land use planning.